DuPont QM44H

MULTI-LAYER DIELECTRIC

Technical Data Sheet

Product Description

DuPont QM44H is a filled, crystallizable screen printed thick film dielectric composition. It is a versatile dielectric (with excellent via resolution) for use in both high reliability and low cost MCM (multi-chip module) and hybrid interconnect applications.

Product Benefits

- Broad conductor compatibility (gold, silver, and mixed metal)
- Thin, 2 print, hermetic dielectric film
- Highly resistant to EMF (Electro-Motive Force) blistering and shorting
- Robust electrical and mechanical properties
- Compatible cofire conductors

Recommended Processing Procedures

Substrates

Properties are based on test on 96% alumina substrates. Substrates of other compositions and from various manufacturers may result in variation in performance properties.

Printing

Printing should be carried out in a clean and well ventilated area. The combined fired thickness of the dielectric should be 30 ± 2µm. This can generally be obtained by printing the individual layers with a 280 mesh stainless steel screen. An emulsion thickness of .3 mils is typically recommended. Thinner emulsion will yield improved via resolution.

Drying

Allow prints to level for 5 - 10 minutes at room temperature. Then dry for 10 - 15 minutes at 150ºC.

Firing

Fire each dielectric print separately in a well ventilated moving conveyor furnace, in air. A 30-minute cycle with a peak temperature of 850ºC held for 10 minutes should be used.

Composition Properties

Test	Properties
Viscosity (Pa.S) [Brookfield HBT, 10 rpm #14 spindle & UC, 25ºC]	300 - 400
Coverage (cm²/g) [based on a fired thickness of 14 µm]	110 - 130
Thinner	DuPont 8250
Typical Physical Properties	
Total Fired Thickness (µm)	30 ± 2
Via Resolution (µm)	≤ 250 - 300
Maximum number circuit layers	< 8
Camber* (mil/in)	< 2
Typical Electrical Properties	
Dielectric Constant (@ 1 MHz	8 - 10
Dissipation Factor (@ 1 MHz) (%)	< 0.2
Leakage Current ** (µA.cm²)	< 1
Insulation Resistance	> 10^{12} @ 100
Breakdown Voltage (V/30µm)	> 1000
EMF Blister Resistance ***	> 30 firing

*measured deflection of 5' x 1' substrate with 5 circuit layer, single sided
** Standard measurements made after 5 min. @ 10VDC
*** Maximum no. of firing performed without blisters observed with Substrate/Au/Diel/Diel/Ag configuration

This table shows anticipated typical physical properties for DuPont QM44H based on specific controlled experiments in our labs and are not intended to represent the product specifications, details of which are available upon request.

Other Systems Components

	Silver System	Mixed Metal System	Gold System
Top Conductor	QM22 (3:1, Cofired) 7484 (3:1, Al W/B) 6277 (6:1)	5771	5771
Inner Conductor	QM17 (Pt/Ag) QM14 (Ag)	QM17 QM14	5771
Via Fill	QM34	QM34 (Inner) QM35 (Top)	5747
Resistor Series	S1X0	S1X0	S1X0

Storage and Shelf Life

Containers should be stored, tightly sealed, in a clean, stable environment at room temperature (<25°C). Shelf life of material in unopened containers is six months from date of shipment. Some settling of solids may occur and compositions should be thoroughly mixed prior to use.

Safety and Handling

For Safety and Handling information pertaining to this product, read the Material Safety Data Sheet (MSDS).

Caution: Do not use in medical applications involving implantation in the human body or contact with internal body fluids or tissue unless the product is provided by DuPont under a formal written contract consistent with the DuPont Policy Regarding Medical Applications of DuPont Materials H-50103-2 ("Medical Applications Policy") and which expressly acknowledges the contemplated use. For additional information, please request a copy of DuPont Medical Caution Statement H-50102-2 and the DuPont Medical Applications Policy.

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